

What is claimed is:

1. A product-on-demand delivery system for agricultural product, the system comprising:

a frame;

5 a main hopper mounted on the frame, said main hopper having a nozzle assembly into which product in said main hopper is directed, the nozzle assembly having an upstream sidewall, a downstream sidewall and a bottom, the nozzle assembly comprising a product outlet;

a primary application unit and a secondary application unit mounted to the frame,
10 each application unit provided with an auxiliary hopper and a product meter for dispensing the product to a field, each product meter in communication with the auxiliary hopper;

a splitter fitting having a splitter inlet, a first splitter outlet and a second splitter outlet, said second splitter outlet oriented for a vertical upward flow of air and product;

15 a primary product hose flow-coupled to said product outlet and to said splitter inlet;
a secondary product hose flow-coupled to said primary product hose to said secondary application unit;

said first splitter outlet flow-coupled to said primary application unit;

an air pump pneumatically coupled to the upstream sidewall of the nozzle
20 assembly by an air supply hose, the air pump generating pressurized air directed into the air supply hose;

the air supply hose having an air inlet that is coupled to the nozzle assembly opposite the product outlet, so that product located in the nozzle assembly is taken up by

the air stream as the air stream passes from the air inlet of the air supply hose through the nozzle assembly to the product outlet, and the air and product passes through the primary product supply hose, through the splitter fitting to the primary application unit and through splitter fitting and through the secondary product supply hose to the secondary application unit, air and product supplying both said primary and secondary application units passing through said primary product hose.

2. A product-on-demand delivery system as defined by claim 1, wherein said second splitter outlet is arranged to direct flow therethrough in a direction having a velocity vector at an obtuse angle with respect to a velocity vector of flow through said splitter inlet.

3. A product-on-demand delivery system as defined by claim 2, wherein the nozzle assembly is provided with a plurality of baffles, the baffles extend between and above the air inlets of the air supply hoses and the respective product outlets of the product hoses, wherein gaps are formed between adjacent baffles.

4. A product-on-demand delivery system as defined by claim 3, comprising an agitator assembly located in the nozzle assembly for agitating product located in the nozzle assembly, wherein the agitator assembly is provided with a plurality of fingers that extend into the gaps formed between adjacent baffles.

5. A product-on-demand delivery system as defined by claim 3, comprising an agitator assembly located in the nozzle assembly for agitating product located in the nozzle assembly, wherein the agitator comprises a transverse rod that is located above the baffles, the transverse rod having the plurality of fingers extending radially outward from the transversely extending rod, wherein the transversely extending rod is rotated back and forth so that the fingers agitate the product located in the nozzle assembly.

6. A product-on-demand delivery system for agricultural product, said system comprising:

an implement frame that can be transported through a field;

a main seed hopper mounted on the frame, the main hopper having a nozzle assembly into which product in the main hopper is directed by gravity, the nozzle assembly having an upstream sidewall, a downstream sidewall and a bottom;

a plurality of planting units are mounted to the frame, each planting unit is provided with a seed meter for metering seed and a furrow opener for forming a planting furrow into which metered seed is deposited, a first seed meter is flow-coupled to the main seed hopper by a primary product supply hose, coupled to the downstream sidewall of the nozzle assembly, a second seed meter is flow-coupled to the primary product hose by a secondary product hose that branches from the primary product hose, said secondary product hose branches from the first product hose at an angle such that the flow velocity vector through the primary hose at the intersection of primary and secondary hoses is at an obtuse angle to the flow velocity vector of product through the secondary hose at the intersection of primary and secondary hoses;

an air pump pneumatically coupled to the nozzle assembly by an air supply hose, the air pump generates an air stream that is directed into the air supply hose, the air supply hose has an air inlet that is coupled to the upstream sidewall of the nozzle assembly opposite the product outlet of the product supply hose, so that the air stream passes from the air inlet of the air supply hose to the product outlet of the product supply hose through the nozzle assembly, so that seed located in the bottom of the nozzle assembly is taken up by the air stream and is directed through the primary product supply hose to the secondary seed meter, and from the secondary product supply hose to the second seed meter.

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7. A product-on-demand delivery system as defined by claim 6, wherein each planting unit is provided with an auxiliary seed hopper located between the product inlet and each seed meter.

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8. A product-on-demand delivery system as defined by claim 7, wherein the nozzle assembly is provided with a plurality of baffles corresponding to the number of application units, the baffles extend between and above the air inlets of the air supply hoses and the respective product outlets of the product hoses so that the air streams from the air supply hoses pass beneath the baffles, wherein gaps are formed between adjacent baffles.

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9. A product-on-demand delivery system as defined by claim 8, wherein said secondary product supply hose extends substantially vertically at said intersection of said primary and secondary product hoses.

5 10. A product-on-demand delivery system as defined by claim 9, wherein an agitator assembly is located in the nozzle assembly for agitating seeds located in the nozzle assembly, wherein the agitator comprises a transverse rod that is located above the baffles, the transverse rod having the plurality of fingers extending radially outward from the transversely extending rod, wherein the fingers are transversely aligned on the
10 transversely extending rod, and wherein the transversely extending rod is rotated back and forth so that the fingers agitate the product located in the nozzle assembly.

11. A product-on-demand delivery system for agricultural product, said system comprising:

15 an implement frame that can be transported through a field;

a main seed hopper mounted on the frame, the main hopper having a nozzle assembly with a concave bottom and an upstream sidewall and a downstream sidewall, the upstream sidewall and the downstream sidewall are outwardly diverging from one another, product in the main hopper is directed to the bottom of the nozzle assembly by
20 gravity;

a plurality of planting units are mounted to the frame, each planting unit is provided with an auxiliary hopper, a seed meter and a furrow opener for forming a planting furrow into which metered seed is deposited;

a plurality of splitter fittings each having one splitter inlet, a first splitter outlet and a second splitter outlet, each second splitter outlet of said splitter fittings coupled to an inlet end of a secondary product hose and each first splitter outlet coupled to an auxiliary hopper, one splitter inlet coupled to a product outlet that is coupled to the downstream
5 sidewall of the nozzle assembly, and remaining splitter inlets each coupled to an outlet end of a secondary product hose of a splitter fitting that is upstream in a product flow direction;

an air pump is pneumatically coupled to the nozzle assembly by an air supply hose, the air pump generates an air stream that is directed into the air supply hose, said
10 air supply hose has an air inlet that is coupled to the upstream sidewall of the nozzle assembly opposite the product outlet, so that the air stream passes from the air inlet of the air supply hose through the nozzle assembly and through the product outlet, so that seed located in the bottom of the nozzle assembly is taken up by the air stream and is directed through the product supply hose to said one splitter inlet.

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12. A product-on-demand delivery system as defined by claim 11, wherein wherein each second splitter outlet is arranged to direct flow therethrough in a direction having a velocity vector at an obtuse angle with respect to a velocity vector of flow through said respective splitter inlet, and each second splitter outlet oriented for a vertical
20 upward flow of air and product.

13. A product-on-demand delivery system as defined by claim 11, wherein the nozzle assembly is provided with a plurality of baffles, the baffles extend between and

above the air inlets of the air supply hoses and the respective product outlets of the product hoses so that the air streams from the air supply hoses pass beneath the baffles, gaps are formed between adjacent baffles.

5 14. A product-on-demand delivery system as defined by claim 11, wherein an agitator assembly is located in the nozzle assembly for agitating seeds located in the nozzle assembly, wherein the agitator assembly comprises a transversely extending rod located above the baffles, the transversely extending rod having a plurality of fingers, the plurality of fingers extend radially outward from the rod into the gaps formed by the
10 adjacent baffles.

15 15. A product-on-demand delivery system for agricultural product, said system comprising:

 a frame;

15 a main hopper mounted on the frame, the main hopper having an air nozzle to which product in the main hopper is directed, an air stream through said air nozzle entraining product therein ;

 a splitter fitting having a splitter inlet and two splitter outlets, said splitter inlet communicating with said nozzle;

20 a primary product hose and a secondary product hose;

 a primary application unit and a secondary application unit, both mounted to the frame, each application unit is provided with a product meter for applying the product to a

field, a first product meter of said primary application unit is coupled to the nozzle by said primary product supply hose; and

a second product meter of said secondary application unit is coupled to the primary product supply hose by said secondary product hose connected thereto at an outlet branch, said outlet branch connected at an angle to the primary product conduit such that a product flow velocity vector in the primary product supply hose at said outlet branch is at an obtuse angle to a flow velocity vector of product flowing through said outlet branch.

16. A product-on-demand delivery system as defined by claim 15, wherein said outlet branch is oriented for a vertical upward flow of air and product.

17. A product-on-demand delivery system as defined by claim 15, wherein each application unit is provided with an auxiliary hopper located between the product supply hose and the product meter.

18. A product-on-demand delivery system as defined by claim 15, wherein an agitator assembly is located in the main hopper for agitating product located in the main hopper, and wherein the agitator comprises a transverse rod, the transverse rod having the plurality of fingers extending radially outward from the transversely extending rod, wherein the transversely extending rod is rotated back and forth so that the fingers agitate the product located in the main hopper.